

CERN School of Computing 2014



Report of Contributions

Contribution ID: 0

Type: **not specified**

Tools and Techniques - Exercise 1

Monday, August 25, 2014 4:50 PM (55 minutes)

The first exercises provide some direct experience with the individual tools and techniques described in Lectures 1 and 2. Teams of two students will work together to update existing applications, working through examples designed to show the strengths and weaknesses of various tools and approaches. This will be followed by small projects for additional development experience. Exercise 3 starts work with code management and release tools.

Presenter: JACOBSEN, Robert (Lawrence Berkeley National Laboratory (LBNL))

Session Classification: Data Analysis

Contribution ID: 1

Type: **not specified**

Presentation of the School

Monday, August 25, 2014 4:00 PM (20 minutes)

Presenter: PACE, Alberto (CERN)

Contribution ID: 2

Type: **not specified**

Opening Session

Contribution ID: 3

Type: **not specified**

Introduction to Physics Computing - Lecture 1

Presenter: QUADT, Arnulf (Georg-August-Universitaet Goettingen (DE))

Contribution ID: 4

Type: **not specified**

Tools and Techniques - Lecture 1

Monday, August 25, 2014 2:00 PM (1 hour)

Introduction to the Track; Tools You Can Use We discuss some of the characteristics of software projects for high energy physics, and some of the issues that arise when people want to contribute to them. This forms the framework for the Software Technologies Track. We then discuss several categories of tools & techniques you can use to make yourself more productive and effective. Continuous testing and documentation has proven to be important in producing high quality work, but it's often difficult to do; we discuss some available approaches. Many problems require specific tools and techniques to solve them effectively: We discuss the examples of performance tuning and memory access problems. Throughout, we discuss software engineering from the perspective of the individual contributor, both as a formal process and how it actually effects what you do.

Presenter: JACOBSEN, Robert (Lawrence Berkeley National Laboratory (LBNL))

Session Classification: Data Analysis

Contribution ID: 5

Type: **not specified**

Tools and Techniques - Lecture 2

Monday, August 25, 2014 3:00 PM (1 hour)

Tools for Collaboration

HEP software is built by huge teams. How can this be done effectively, while still giving people satisfying tasks to perform?

This lecture discusses some of the technical approaches used. Source control (e.g. SVN, Git) tools are becoming common. We discuss the different ways they can be used with their advantages and disadvantages. We then address the larger area of release control techniques (e.g. CMT, CMake) and release testing & distribution. Our focus is on why this is considered a hard problem, and what the current issues are when dealing with it.

We close with a summary of observations.

Presenter: JACOBSEN, Robert (Lawrence Berkeley National Laboratory (LBNL))

Session Classification: Data Analysis

Contribution ID: 6

Type: **not specified**

Tools and Techniques - Exercise 2

Monday, August 25, 2014 5:50 PM (55 minutes)

The first exercises provide some direct experience with the individual tools and techniques described in Lectures 1 and 2. Teams of two students will work together to update existing applications, working through examples designed to show the strengths and weaknesses of various tools and approaches. This will be followed by small projects for additional development experience. Exercise 3 starts work with code management and release tools.

Presenter: JACOBSEN, Robert (Lawrence Berkeley National Laboratory (LBNL))

Session Classification: Data Analysis

Contribution ID: 7

Type: **not specified**

Tools and Techniques - Exercise 3

Tuesday, August 26, 2014 4:15 PM (55 minutes)

The first exercises provide some direct experience with the individual tools and techniques described in Lectures 1 and 2. Teams of two students will work together to update existing applications, working through examples designed to show the strengths and weaknesses of various tools and approaches. This will be followed by small projects for additional development experience. Exercise 3 starts work with code management and release tools.

Presenter: JACOBSEN, Robert (Lawrence Berkeley National Laboratory (LBNL))

Session Classification: Data Analysis

Contribution ID: 8

Type: **not specified**

Introduction to Physics Computing - Lecture 2

Tuesday, August 26, 2014 8:45 AM (55 minutes)

Presenter: QUADT, Arnulf (Georg-August-Universitaet Goettingen (DE))

Session Classification: Data Analysis

Contribution ID: 9

Type: **not specified**

Computer Architecture & Perf. Tuning - Lecture 1

Tuesday, August 26, 2014 9:45 AM (55 minutes)

Understanding scalable hardware

The lecture describes the hardware architecture of a modern x86_64 PC server. Architectures from other companies, such as Nvidia and ARM, will also be mentioned. Acceleration opportunities (but also bottlenecks) in the architecture will be covered in detail with an aim to give the students a good understanding of what resources are available from a hardware viewpoint.

We will also discuss several strategies which can allow software to scale to the maximum resource potential in a given architecture. These strategies are based on both data and task parallelism. We will stress the importance of a Data Oriented Design and also mention the issue of “performance portability” across platforms. Some important factors related to programming styles will be reviewed. To back up everything with evidence, a couple of scalable examples from physics will be portrayed.

Presenter: Mr JARP, Sverre (CERN)

Session Classification: Base Technologies

Contribution ID: **10**Type: **not specified**

Computer Architecture & Perf. Tuning - Lecture 2

Tuesday, August 26, 2014 11:30 AM (55 minutes)

“Architectural Details and Performance Studies”

Considering the rise of complex many-core processors, a sufficient understanding of their architecture and of the relevant performance tuning opportunities has become an indispensable element of software development. Although by using various tools we are often able to get a generous peek both inside the hardware and software, drawing high-level conclusions that impact our software is not always straightforward. Another considerable challenge comes from accelerators and co-processors, where different computing paradigms take precedence, such as extreme data parallelism, different math capabilities, the importance of special languages as well as memory size and topology changes. The objective of this lecture is to bring the audience closer to “where it matters” in modern computing systems, and to identify important paths for high performance.

Presenter: NOWAK, Andrzej (CERN)

Session Classification: Base Technologies

Contribution ID: 11

Type: **not specified**

Tools and Techniques - Exercise 4

Tuesday, August 26, 2014 5:15 PM (55 minutes)

After the two-person teams acquire additional experience with the code management and release tools in exercise 4 and 5, in exercise 6 we will group projects to demonstrate some of the real-world issues discussed in the lecture. Groups of two teams will first work together to create a functional release from individual sub-projects at various stages of completion to show the strengths and weaknesses of test and release tools. This is followed by a larger scale exercise with groups of multiple teams.

Presenter: JACOBSEN, Robert (Lawrence Berkeley National Laboratory (LBNL))

Session Classification: Data Analysis

Contribution ID: 12

Type: **not specified**

Tools and Techniques - Exercise 5

Tuesday, August 26, 2014 6:15 PM (55 minutes)

After the two-person teams acquire additional experience with the code management and release tools in exercise 4 and 5, in exercise 6 we will group projects to demonstrate some of the real-world issues discussed in the lecture. Groups of two teams will first work together to create a functional release from individual sub-projects at various stages of completion to show the strengths and weaknesses of test and release tools. This is followed by a larger scale exercise with groups of multiple teams.

Presenter: JACOBSEN, Robert (Lawrence Berkeley National Laboratory (LBNL))

Session Classification: Data Analysis

Contribution ID: 13

Type: **not specified**

Tools and Techniques - Exercise 6

Tuesday, August 26, 2014 7:15 PM (45 minutes)

After the two-person teams acquire additional experience with the code management and release tools in exercise 4 and 5, in exercise 6 we will group projects to demonstrate some of the real-world issues discussed in the lecture. Groups of two teams will first work together to create a functional release from individual sub-projects at various stages of completion to show the strengths and weaknesses of test and release tools. This is followed by a larger scale exercise with groups of multiple teams.

Presenter: JACOBSEN, Robert (Lawrence Berkeley National Laboratory (LBNL))

Session Classification: Data Analysis

Contribution ID: 14

Type: **not specified**

Software Design in the Many-Cores era - Lecture 1

Wednesday, August 27, 2014 8:45 AM (1 hour)

Outfitting a Modern HEP Data Processing Framework for Concurrency

Even though the miniaturization of transistors on chips continues like predicted by Moore's law, computer hardware starts to face scaling issues, so-called performance 'walls'. Probably, the best known is the 'power wall', which limits clock frequencies. Amongst others, a way of increasing processor performance remains now to integrate many cores in the same chip. At the same time, the upcoming LHC upgrade will increase the required CPU power drastically. Both problems challenge the current way of software design in high energy physics (HEP). Developers in high energy physics are forced to re-think their ways of software design and need to move to massively parallel applications. This lecture will explain the current HEP software design, the hardware and physics issues that need to be tackled, and possible approaches to achieve the required level of parallelization.

Presenters: HEGNER, Benedikt (CERN); PIPARO, Danilo (CERN)

Session Classification: Base Technologies

Contribution ID: 15

Type: **not specified**

Secure Software - Lecture 1

Wednesday, August 27, 2014 9:45 AM (1 hour)

Presenter: LOPIENSKI, Sebastian (CERN)

Session Classification: Base Technologies

Contribution ID: 16

Type: **not specified**

Secure Software - Lecture 2

Wednesday, August 27, 2014 11:30 AM (55 minutes)

Presenter: LOPIENSKI, Sebastian (CERN)

Session Classification: Base Technologies

Contribution ID: 17

Type: **not specified**

Secure Software - Exercise 1

Wednesday, August 27, 2014 4:30 PM (1h 5m)

Presenters: Dr LO PRESTI, Giuseppe (CERN); LOPIENSKI, Sebastian (CERN)

Session Classification: Base Technologies

Contribution ID: **18**

Type: **not specified**

Secure Software - Exercise 2

Wednesday, August 27, 2014 5:35 PM (1h 5m)

Presenters: Dr LO PRESTI, Giuseppe (CERN); LOPIENSKI, Sebastian (CERN)

Session Classification: Base Technologies

Contribution ID: 19

Type: **not specified**

Secure Software - Exercise 3

Wednesday, August 27, 2014 6:40 PM (1h 5m)

Presenters: Dr LO PRESTI, Giuseppe (CERN); LOPIENSKI, Sebastian (CERN)

Session Classification: Base Technologies

Contribution ID: 20

Type: **not specified**

Software Design in the Many-Cores era - Lecture 2

Thursday, August 28, 2014 8:45 AM (1 hour)

Base Concepts of Parallel Programming: A Pragmatic Approach

This lecture will explain the main concepts behind concurrent programming. First, a theoretical introduction into threads will be given. As the new C++ standard (C++11) now provides built-in support for parallel programming, the new features of this standard will be shown. The second part of this lecture builds thread-safety and concrete technologies to tackle the problem of concurrent data access.

Presenters: HEGNER, Benedikt (CERN); PIPARO, Danilo (CERN)

Session Classification: Base Technologies

Contribution ID: 21

Type: **not specified**

Software Design in the Many-Cores era - Lecture 3

Thursday, August 28, 2014 9:45 AM (1 hour)

Development Patterns for Parallel Software Development

The focus of this lecture lies on repeating a few design patterns of sequential software. It then discusses under which conditions these can be transformed into parallel design patterns. It discusses how different level of constraints affect the scaling of the parallel patterns shown.

Presenters: HEGNER, Benedikt (CERN); PIPARO, Danilo (CERN)

Session Classification: Base Technologies

Contribution ID: 22

Type: **not specified**

Secure Software - Lecture 3

Thursday, August 28, 2014 11:30 AM (55 minutes)

Web App. Security Debriefing

Presenter: LOPIENSKI, Sebastian (CERN)

Session Classification: Base Technologies

Contribution ID: 23

Type: **not specified**

Software Design in the Many-Cores era - Lecture 4

Friday, August 29, 2014 8:45 AM (1 hour)

Understanding, Debugging and Profiling a Complex Multithreaded Application

Writing thread-safe code is a complex problem and difficult to master. This lecture explains basic tools and techniques assisting you in parallel software development. Firstly, we will show basic examples and tools for static code analysis. Then we will have a look at how to understand and debug a multithreaded application with the GNU debugger. Finally, we will tackle performance measurements of applications and how to identify which parts deserve speed improvement or parallelization.

Presenters: HEGNER, Benedikt (CERN); PIPARO, Danilo (CERN)

Session Classification: Base Technologies

Contribution ID: 24

Type: **not specified**

Software Design in Many-core area - Exercise 2

Friday, August 29, 2014 9:45 AM (1 hour)

Presenters: HEGNER, Benedikt (CERN); PIPARO, Danilo (CERN)

Session Classification: Base Technologies

Contribution ID: 25

Type: **not specified**

Software Design in Many-core area - Exercise 3

Friday, August 29, 2014 11:30 AM (55 minutes)

Presenters: HEGNER, Benedikt (CERN); PIPARO, Danilo (CERN)

Session Classification: Base Technologies

Contribution ID: 26

Type: **not specified**

Software Design in Many-core area - Exercise 3

Friday, August 29, 2014 4:30 PM (1h 5m)

Presenters: HEGNER, Benedikt (DESY); PIPARO, Danilo (CERN)

Session Classification: Base Technologies

Contribution ID: 27

Type: **not specified**

Computer Architecture & Perf. Tuning - Exercise 1

Friday, August 29, 2014 5:35 PM (1h 5m)

Presenters: NOWAK, Andrzej (CERN); Mr JARP, Sverre (CERN)

Session Classification: Base Technologies

Contribution ID: 28

Type: **not specified**

Computer Architecture & Perf. Tuning - Exercise 2

Friday, August 29, 2014 6:40 PM (1h 5m)

Presenters: NOWAK, Andrzej (CERN); Mr JARP, Sverre (CERN)

Session Classification: Base Technologies

Contribution ID: 29

Type: **not specified**

Data Analysis - Lecture 1

Saturday, August 30, 2014 8:45 AM (1 hour)

Presenter: PULJAK, Ivica (University of Split (HR))

Session Classification: Data Analysis

Contribution ID: **30**

Type: **not specified**

Data Analysis - Lecture 2

Saturday, August 30, 2014 9:45 AM (1 hour)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: 31

Type: **not specified**

Data Analysis - Lecture 3

Saturday, August 30, 2014 11:30 AM (55 minutes)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: 32

Type: **not specified**

Data Technologies - Lecture 1

Monday, September 1, 2014 8:45 AM (1 hour)

Presenter: PACE, Alberto (CERN)

Session Classification: Data Technologies

Contribution ID: 33

Type: **not specified**

Data Technologies - Lecture 2

Monday, September 1, 2014 9:45 AM (1 hour)

Presenter: PACE, Alberto (CERN)

Session Classification: Data Technologies

Contribution ID: 34

Type: **not specified**

Data Analysis - Lecture 4

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Contribution ID: 35

Type: **not specified**

Data Analysis - Exercise 1

Monday, September 1, 2014 4:30 PM (1h 5m)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: 36

Type: **not specified**

Data Analysis - Exercise 2

Monday, September 1, 2014 5:35 PM (1h 5m)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: 37

Type: **not specified**

Data Analysis - Exercise 3

Monday, September 1, 2014 6:40 PM (1h 5m)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: **38**

Type: **not specified**

Data Technologies - Lecture 3

Tuesday, September 2, 2014 8:45 AM (1 hour)

Presenter: PACE, Alberto (CERN)

Session Classification: Data Technologies

Contribution ID: 39

Type: **not specified**

Data Technologies - Lecture 4

Tuesday, September 2, 2014 9:45 AM (1 hour)

Presenter: PACE, Alberto (CERN)

Session Classification: Data Technologies

Contribution ID: 40

Type: **not specified**

Networking Performance - Lecture 2

Presenter: Mr FLUCKIGER, Francois (CERN - IT/DI)

Contribution ID: 41

Type: **not specified**

Data Technologies - Exercise 1

Tuesday, September 2, 2014 4:30 PM (1h 5m)

Presenters: PACE, Alberto (CERN); Mr PETERS, Andreas Joachim (CERN)

Session Classification: Data Technologies

Contribution ID: 42

Type: **not specified**

Data Technologies - Exercise 2

Tuesday, September 2, 2014 5:35 PM (1h 5m)

Presenters: PACE, Alberto (CERN); Mr PETERS, Andreas Joachim (CERN)

Session Classification: Data Technologies

Contribution ID: 43

Type: **not specified**

Data Technologies - Exercise 3

Tuesday, September 2, 2014 6:40 PM (1h 5m)

Presenters: PACE, Alberto (CERN); Mr PETERS, Andreas Joachim (CERN)

Session Classification: Data Technologies

Contribution ID: 44

Type: **not specified**

Data Analysis - Lecture 5

Wednesday, September 3, 2014 8:45 AM (1 hour)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: 45

Type: **not specified**

Data Analysis - Lecture 6

Wednesday, September 3, 2014 9:45 AM (1 hour)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: 46

Type: **not specified**

Data Technologies - Lecture 5

Wednesday, September 3, 2014 11:30 AM (1 hour)

Presenter: PACE, Alberto (CERN)

Session Classification: Data Technologies

Contribution ID: 47

Type: **not specified**

Multivariate Visualisation - Lecture 1

Wednesday, September 3, 2014 1:30 PM (1 hour)

Presenter: RADBURN-SMITH, Benjamin (Purdue University (US))

Session Classification: Data Analysis

Contribution ID: 48

Type: **not specified**

Data Technologies - Exercise 4

Thursday, September 4, 2014 8:45 AM (1 hour)

Presenters: PACE, Alberto (CERN); Mr PETERS, Andreas Joachim (CERN)

Session Classification: Data Technologies

Contribution ID: 49

Type: **not specified**

Data Technologies - Exercise 5

Thursday, September 4, 2014 9:45 AM (1 hour)

Presenters: PACE, Alberto (CERN); Mr PETERS, Andreas Joachim (CERN)

Session Classification: Data Technologies

Contribution ID: 50

Type: **not specified**

Data Analysis - Exercise 4

Thursday, September 4, 2014 11:30 AM (1 hour)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: 51

Type: **not specified**

Data Analysis - Exercise 5

Thursday, September 4, 2014 1:30 PM (55 minutes)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: 52

Type: **not specified**

Presentations by students

Contribution ID: 53

Type: **not specified**

Presentations by students

Contribution ID: 54

Type: **not specified**

Opening session

Contribution ID: 55

Type: **not specified**

Intervention of the Rector of University of Minho

Monday, August 25, 2014 9:15 AM (10 minutes)

Presenter: CUNHA, Antonio

Session Classification: 60 years of CERN and Portuguese membership

Contribution ID: 56

Type: **not specified**

The Cern School of Computing

Monday, August 25, 2014 11:15 AM (15 minutes)

Presenter: PACE, Alberto (CERN, Director of CSC)

Session Classification: 60 years of CERN and Portuguese membership

Contribution ID: 57

Type: **not specified**

Presentation of the School and Opening declaration

Presenter: PACE, Alberto (CERN)

Contribution ID: 58

Type: **not specified**

CERN, 60 years of Science for Peace

Presenter: HEUER, Rolf (CERN Director General)

Contribution ID: 59

Type: **not specified**

Intervention of the President of LIP (Laboratorio Experimental de Fisica de Particulas)

Monday, August 25, 2014 9:25 AM (10 minutes)

Presenter: GAGO, Jose Mariano

Session Classification: 60 years of CERN and Portuguese membership

Contribution ID: **60**

Type: **not specified**

Introduction to Physics computing

Monday, August 25, 2014 11:30 AM (55 minutes)

Presenter: QUADT, Arnulf (Georg-August-Universitaet Goettingen (DE))

Session Classification: 60 years of CERN and Portuguese membership

Contribution ID: 61

Type: **not specified**

Intervention of the Portuguese National Science Foundation, FCT (on behalf of the Ministry of Education and Science),

Monday, August 25, 2014 9:35 AM (10 minutes)

Presenter: SEABRA, Miguel

Session Classification: 60 years of CERN and Portuguese membership

Contribution ID: **62**

Type: **not specified**

CERN, 60 years of Science for Peace

Monday, August 25, 2014 9:45 AM (45 minutes)

Presenter: HEUER, Rolf (CERN General Director)

Session Classification: 60 years of CERN and Portuguese membership

Contribution ID: 63

Type: **not specified**

Challenges of the Computing Infrastructures for Scientific Research of the Coming Years

Monday, August 25, 2014 11:00 AM (15 minutes)

Presenter: HEMMER, Frederic (CERN, IT Department Head)

Session Classification: 60 years of CERN and Portuguese membership

Contribution ID: **64**

Type: **not specified**

Data Analysis - Lecture 4

Monday, September 1, 2014 11:30 AM (1 hour)

Presenter: PULJAK, Ivica (Technical University of Split FESB)

Session Classification: Data Analysis

Contribution ID: 65

Type: **not specified**

Spotlight on Big Data/Technologies -... inspired by nature, society, physics and mathematics

Tuesday, September 2, 2014 11:30 AM (1 hour)

A look behind Big Data and Cloud technology and into the future of money and civilization archiving tools.

Presenter: Mr PETERS, Andreas Joachim (CERN)

Session Classification: Data Technologies

Contribution ID: 66

Type: **not specified**

Calculability and complexity

Friday, September 5, 2014 9:45 AM (8 minutes)

Brief introduction of the analysis of calculability and complexity, and introduction of theoretical computer science. Turing machine, complexity hierarchy, etc...

Presenter: MARTINA, Stefano (Universita e INFN (IT))

Session Classification: Presentations by students

Contribution ID: 67

Type: **not specified**

Challenges in the CERN Accelerator Complex

Friday, September 5, 2014 9:59 AM (8 minutes)

Beam instabilities and loss of Landau damping are major limiting factors for the HL-LHC era. A short introduction to how the beam is produced and what the major challenges are.

Presenter: TIMKO, Helga (CERN)

Session Classification: Presentations by students

Contribution ID: 68

Type: **not specified**

Clustering

Friday, September 5, 2014 10:13 AM (8 minutes)

In the era before 'Big data' LHC physicists used clustering algorithms to join 3 dimensional objects together inside their detectors. Now similar algorithms, working in N dimensions, are revolutionising the way that people choose which TV to watch, how the business world makes transactions and even how geeks find love. Clustering can be used to create structures that isolate nuances in the larger data set, infer the properties of missing variables, or split the data into smaller chunks for which more focused algorithms can be optimised. The science of clustering algorithms focus on how to both how such applications can be optimised, how clusters can be recombined combined and how to verify the validity of the properties that these clusters suggest.

Presenter: CROFT, Vincent Alexander (Radboud University Nijmegen (NL))

Session Classification: Presentations by students

Contribution ID: 69

Type: **not specified**

Modern HEP Data Analysis - How to handle the growing complexity

Friday, September 5, 2014 10:27 AM (8 minutes)

In the era before 'Big data' LHC physicists used clustering algorithms to join 3 dimensional objects together inside their detectors. Now similar algorithms, working in N dimensions, are revolutionising the way that people choose which TV to watch, how the business world makes transactions and even how geeks find love. Clustering can be used to create structures that isolate nuances in the larger data set, infer the properties of missing variables, or split the data into smaller chunks for which more focused algorithms can be optimised. The science of clustering algorithms focus on how to both how such applications can be optimised, how clusters can be recombined combined and how to verify the validity of the properties that these clusters suggest.

Presenter: FRIESE, Raphael Marius (KIT - Karlsruhe Institute of Technology (DE))

Session Classification: Presentations by students

Contribution ID: 70

Type: **not specified**

Non-parametric density estimation

Friday, September 5, 2014 10:41 AM (8 minutes)

Fitting is often used to model data distributions of different categories in order to identify, or unfold, these components in regions of the parameter space where they are mixed. The traditional use of high-order polynomial functions is now being replaced by non-parametric techniques as the Kernel Density Estimation (KDE) and Density Estimation Trees (DETs). Among the advantages of these technique there is the applicability in multi-dimensional, multi-modal datasets. I briefly introduce the concept of non-parametric density estimation, and of the KDE and DET techniques taking examples of applications from recent HEP papers.

Presenter: ANDERLINI, Lucio (Laboratoire d'Annecy de Physique de Particules)

Session Classification: Presentations by students

Contribution ID: 71

Type: **not specified**

Parallelism for free with Haskell

Friday, September 5, 2014 10:54 AM (6 minutes)

Haskell is a standardised, general-purpose purely functional programming language with non-strict semantics and strong static typing. In this talk some of these properties will be demonstrated by working through a very simple example. Having these properties, it is possible to build safe and highly parallel applications running on multi-core architectures or GPUs without significant effort from the developer's side. This concept will also be illustrated by slightly changing the original example to magically turn it into a parallel application. The talk will be summed up by some useful links, references and information regarding learning material, upcoming events and how to become involved in the Haskell community.

Presenter: PEK, Janos Daniel (CERN)

Session Classification: Presentations by students

Contribution ID: 72

Type: **not specified**

Performance of RAID arrays

Friday, September 5, 2014 11:30 AM (8 minutes)

1) interfaces 2) low productivity RAID 5 3) SSD 4) Inefficiency of the classic RAID with SSD

Presenter: SOKOLOV, Michael (SRV24)

Session Classification: Presentations by students

Contribution ID: 73

Type: **not specified**

Profiling code in Python

Friday, September 5, 2014 11:43 AM (8 minutes)

Python code is much easier to write than C, yet much less efficient. It's often assumed that Python is not performance-oriented and therefore making effort to optimize it doesn't pay off. However, if there arises a need to profile the code and find bottlenecks we are not completely lost. In this talk I will tell why `perf(_deluxe.py)` is not suitable for this purpose and which tools can we take instead

Presenter: SZOSTEK, Pawel (CERN)

Session Classification: Presentations by students

Contribution ID: 74

Type: **not specified**

Puppet is so awesome it sucks

Friday, September 5, 2014 11:56 AM (6 minutes)

Puppet is IT automation software that defines and enforces the state of your infrastructure throughout your software development cycle. From provisioning and configuration to orchestration and reporting, from initial code development through production release and updates, Puppet frees sysadmins from writing one-off, fragile scripts and other manual tasks. At the same time, Puppet ensures consistency and dependability across your infrastructure. With Puppet, repetitive tasks are automated away, so sysadmins can quickly deploy business applications, scaling easily from tens of servers to thousands, both on-premise and in the cloud. In the talk we will see why this software's idea is so awesome.

Presenter: MOHAMED, Hristo (University of Sofia (BG))

Session Classification: Presentations by students

Contribution ID: 75

Type: **not specified**

Software Defined Networking - programming your network

Friday, September 5, 2014 12:07 PM (8 minutes)

Software Defined Networking is a new model for managing and controlling networks that emerged from the need to make the network more agile in virtualized datacentre environments. Given the short time of the presentation I will present the concept of SDN (and OpenFlow, the main underlying protocol), by analogy to traditional networking, highlighting the main advantages (centralized control, hence full/better control of the network), yet point out potential caveats (scalability issues, limitations in hardware deployments).

Presenter: STANCU, Stefan Nicolae (CERN)

Session Classification: Presentations by students

Contribution ID: 76

Type: **not specified**

Toward construction of neutron diffractometer for protein crystal

Friday, September 5, 2014 12:20 PM (8 minutes)

We performed a time-of-flight (TOF) single crystal neutron diffraction experiment with a diffractometer (the IBARAKI Biological Crystal Diffractometer (iBIX)) installed at a coupled moderator (CM) pulsed neutron source in J-PARC using single crystal silicon, and we determined several candidates for fundamental fitting functions to faithfully reproduce the TOF Bragg reflection profile asymmetries with the longer tail shape. The Vavilov and Landau distributions used to describe the energy loss of charged particles traversing a thin absorber were found to be in excellent agreement with the observed TOF profile. We are planning to design a new TOF single crystal diffractometer installed at a decoupled moderator (DM) pulsed neutron source in J-PARC. The peak profile provides narrow neutron pulses with short tail. In any event, however, it is expected that the Vavilov and Landau functions are very effective and appropriate for use in the TOF distribution of Bragg reflections because there is no fundamental difference in the neutron moderation process between the two kinds of moderator. It is possible to make use of this functions for the integration of Bragg reflection in the case of profile-fitting refinement for protein sample; this functions might be also be applicable to peak separation of the overlapped Bragg reflection in the TOF direction in foreseeable future.

Presenter: KATSUAKI, Tomoyori (KEK)

Session Classification: Presentations by students